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LINIAK, BERENATO & WHITE
Suite 240
6550 Rock Spring Drive
Bethesda, MD 20817

EXAMINER

ESTREMSKY, SHERRY LYNN

| ART UNIT | PAPER NUMBER |
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3681

DATE MAILED: 06/30/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/785,088

Applicant(s)

KROPPE, WILLIAM J.

Examiner

Sherry L. Estremsky

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-6, 10-13 and 15-19 is/are rejected.
- 7) ☒ Claim(s) 7-9, 14 and 20 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 25 February 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date ____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

DETAILED ACTION

Claim Objections

1. Claim 20 is objected to because of the following informality: it appears --is-- should be inserted between "system" and "one of" in line 2. Appropriate correction is required.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-6, 10, 11, 13, 15, 18, and 19 are rejected under 35 U.S.C. 102(b) as being anticipated by Imaseki et al., U. S. Patent 4,921,060.

Imaseki et al. shows in figures 2 and 3 an integrated fluid control system for a motor vehicle having at least one drive axle having left and right drive axle shafts 15,14 each provided with a wheel 17,16 mounted thereon.

A vehicle torque control system includes at least one fluidly operated clutch 26 provided to regulate a drive torque distribution between the wheels 17,16 of the vehicle in order to improve traction and stability of the vehicle on a drive surface (column 1, lines 14-29, column 1, line 62 to column 2, line 53).

A vehicle body roll control system includes at least one fluidly operated force device 21,20 operatively connecting sprung and unsprung masses of the motor vehicle (being that they

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constitute part of the suspension units; column 3, lines 64-65) and provided to tilt a vehicle body relative to a vehicle chassis so as to counteract a rollover-inducing force (column 1, lines 64-66 and column 3, lines 64-68).

Pressurized oil source 30 is a common source of fluid pressure provided to operate both the vehicle body roll control system and the vehicle torque control system (figure 2; column 4, lines 1-3 and 7-12).

(claim 1)

The torque control system includes at least one variable control valve 35 in fluid communication with the common source of fluid pressure 30 for selectively regulating a fluid pressure supplied to the at least one clutch 26 from the common source of pressure 30 for continuously varying the torque transfer ratio through the clutch 26 between the engaged and disengaged conditions according to a determined slip limiting force ΔT (column 4, lines 7-12 and column 4, line 66 to column 5, line 2). The vehicle body roll control system includes at least one variable control valve 34,33 in fluid communication with the common source of fluid pressure 30 for selectively regulating a fluid pressure supplied to the at least one device 21,20 from the source of fluid pressure 30 (column 4, lines 1-4).

(claim 2)

The at least one variable control valve 35 of the torque control system and the at least one variable control valve 34,33 of the vehicle body roll control system are selectively and variably controlled by an electronic controller 36 in response to at least one vehicle parameter (column 4, lines 13-21).

(claim 3)

The torque control system includes a differential assembly 13 coupled to each of the left and right axle shafts 15,14 outwardly extending from the differential assembly.

A fluidly operated selectively engageable lock-up clutch 26 limits relative rotation between the left and right axle shafts.

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A lock-up clutch actuator selectively operates the lock-up clutch between a disengaged condition and an engaged condition in response to the fluid pressure from the common source of fluid pressure 30.

(claim 4)

The torque control system includes a variable lock-up control valve 35 in fluid communication with the common source of fluid pressure 30 for selectively regulating a fluid pressure supplied to the lock-up clutch actuator for continuously varying the torque transfer ratio through the lock-up clutch between the engaged and disengaged conditions.

(claim 5)

The lock-up clutch is a friction clutch (column 4, lines 5-6).

(claim 6)

The vehicle body roll control system includes a variable roll control valve 34,33 in fluid communication with the common source of fluid pressure 30 for selectively regulating a fluid pressure supplied to the fluidly operated force device 21,20.

(claim 10)

The at least one fluidly operated force device of the vehicle body roll control system is a fluid pressure actuator (column 3, lines 64-68).

(claim 11)

The torque control system and the vehicle body roll control system are selectively and variably controlled by an electronic controller 36 in response to at least one vehicle parameter (column 4, lines 13-21).

(claim 13)

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Though not expressly stated in the specification, the system is understood to include a fluid pump since the common source of fluid pressure 30 is described as "a pressurized oil source 30" (column 4, lines 2-3).

(claim 15)

The electronic controller 36 is connected to a plurality of sensors 40,39,38,37 each indicative of at least one vehicle parameter as a control input.

(claim 18)

At least one vehicle parameter is a vehicle speed V (column 4, lines 43-50).

(claim 19)

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 12, 16, and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Imaseki et al. in view of Clare et al., U. S. Patent 6,179,310.

Imaseki et al. discloses an integrated fluid control system as described above in the rejections of claims 11 and 15. Though Imaseki et al. also discloses that the fluid pressure actuators of the vehicle body roll control system are hydraulic cylinders (column 3, lines 64-68)

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constituting part of the suspension units and presumably include pistons to interconnect the actuators between the sprung and unsprung masses of the vehicle, this is not disclosed.

Clare et al. shows in figure 1 a vehicle body roll control system with fluid pressure actuators including pressure cylinders 33,35 (column 5, lines 25-26 and 29) in fluid communication with variable roll valves 43,44 (column 5, lines 9-33), pistons 38 reciprocating within the cylinders, and piston rods 39 connected to the pistons 38 and extending through the cylinders, with distal ends of the cylinders being secured to the unsprung mass 13(16) of the vehicle (column 4, line 51) and distal ends of the piston rods are secured to the sprung mass 17 of the vehicle (column 4, line 50).

(claim 12)

The source of fluid pressure for the vehicle body roll control system includes a fluid pump 36 and use of a fluid pressure accumulator in fluid communication with the pump is disclosed column 7, lines 60-65.

(claim 16)

The source of fluid pressure includes a fluid reservoir 37 storing a supply of an appropriate fluid.

(claim 17)

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify Imaseki et al. to use pistons within cylinders mounted between the vehicle sprung and unsprung masses and to include a fluid accumulator and reservoir in view of Clare et al. because the cylinder and piston arrangement allows reactive vehicle stabilization (Clare et al., column 1, lines 18-35 and line 66 to column 2, line 14), the accumulator provides an effective way of modulating the pump pressure (Clare et al., column 7, lines 60-65), and the reservoir allows variable pressures within the system by providing a drain for the fluid pressure (column 4, lines 62-65).

Allowable Subject Matter

5. Claims 7-9, 14, and 20 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

U. S. Patent 4,271,722 (Campbell) June 1981 - discloses a differential with left and right axle disconnecting/connecting clutches actuated by air pressure or vacuum.

U. S. Patent 4,625,584 (Onodera) December 1986 - discloses a differential with left and right axle disconnecting/connecting clutch actuated by a push/pull cable.

(Note that there is no motivation in the above mentioned patents to make the control of disconnect clutches interrelated with control of a limited slip clutch and/or vehicle body roll control force device.)

U. S. Patent 4,741,407 (Torii et al.) May 1988 - discloses a control system for a limited slip differential controls the slip limitation and is associated with a suspension control system.

U. S. Patent 4,966,249 (Imaseki) October 1990 - discloses a limited slip differential with an active torque distribution controller which operates to provide vehicle body roll control.

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U. S. Patent 5,301,766 (Momiyama et al.) April 1994 - discloses an interrelated power steering and limited slip differential control system.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sherry L. Estremsky whose telephone number is (571) 272-7090. The examiner can normally be reached on Tuesday and Friday from 7:30 a.m. to 6:00 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Charles Marmor can be reached on (571) 272-7095. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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SHERRY ESTREMSKY
PRIMARY EXAMINER
AU3681 6-26-05